

WHAT IS CLAIMED IS:

1                   1.       A chimeric molecule comprising an angiogenic factor linked to a  
2       targeting molecule that specifically binds to a vascular endothelium.

1                   2.       The chimeric molecule of claim 1, wherein the angiogenic factor  
2       specifically binds to at least one of VEGF-R1, VEGF-R2, or VEGF-R3.

1                   3.       The chimeric molecule of claim 1, wherein the targeting molecule  
2       is a peptide.

1                   4.       The chimeric molecule of claim 1, wherein the angiogenic factor is  
2       vascular endothelial growth factor A (VEGF-A), vascular endothelial growth factor A<sub>121</sub>  
3       (VEGF- A<sub>121</sub>), vascular endothelial growth factor A<sub>145</sub> (VEGF-A<sub>145</sub>), vascular endothelial  
4       growth factor A<sub>165</sub> (VEGF- A<sub>165</sub>), vascular endothelial growth factor A<sub>189</sub> (VEGF- A<sub>189</sub>),  
5       vascular endothelial growth factor A<sub>206</sub> (VEGF- A<sub>206</sub>), vascular endothelial growth factor  
6       B (VEGF-B), vascular endothelial growth factor B<sub>167</sub> (VEGF- B<sub>167</sub>), vascular endothelial  
7       growth factor B<sub>186</sub> (VEGF-B<sub>186</sub>), vascular endothelial growth factor C (VEGF-C),  
8       vascular endothelial growth factor D (VEGF-D), vascular endothelial growth factor E  
9       (VEGF-E), placental growth factor (PlGF), acidic fibroblast growth factor (aFGF), basic  
10      fibroblast growth factor (bFGF), or angiopoietin-1 (Ang1).

1                   5.       The chimeric molecule of claim 1, wherein the angiogenic factor is  
2       Ang2, endostatin or angiostatin.

1                   6.       The chimeric molecule of claim 1 that is a fusion protein, wherein  
2       the fusion protein comprises an angiogenic factor linked to a targeting molecule that  
3       specifically binds to a vascular endothelium.

1                   7.       The fusion protein of claim 6, wherein the angiogenic factor is  
2       VEGF-B, vascular endothelial growth factor B<sub>167</sub> (VEGF- B<sub>167</sub>), vascular endothelial  
3       growth factor B<sub>186</sub> (VEGF-B<sub>186</sub>), or vascular endothelial growth factor C (VEGF-C).

1                   15.      A method of increasing cardiac neovascularization comprising  
2       contacting endothelial cells of the cardiac vasculature with a chimeric molecule wherein  
3       the chimeric molecule comprises an angiogenic factor linked to a targeting molecule that  
4       specifically binds to a vascular endothelium.

1 16. The method of claim 15, wherein the angiogenic factor specifically  
2 binds to at least one of VEGF-R1, VEGF-R2, or VEGF-R3.

1 17. The chimeric molecule of claim 15, wherein the targeting molecule  
2 is a peptide.

1 18. The method of claim 15, wherein the angiogenic is vascular growth  
2 factor A (VEGF-A), vascular endothelial growth factor A<sub>121</sub> (VEGF- A<sub>121</sub>), vascular  
3 endothelial growth factor A<sub>145</sub> (VEGF-A<sub>145</sub>), vascular endothelial growth factor A<sub>165</sub>  
4 (VEGF- A<sub>165</sub>), vascular endothelial growth factor A<sub>189</sub> (VEGF- A<sub>189</sub>), vascular endothelial  
5 growth factor A<sub>206</sub> (VEGF- A<sub>206</sub>), vascular endothelial growth factor B (VEGF-B),  
6 vascular endothelial growth factor B<sub>167</sub> (VEGF- B<sub>167</sub>), vascular endothelial growth factor  
7 B<sub>167</sub> (VEGF-B<sub>186</sub>), vascular endothelial growth factor C (VEGF-C), vascular endothelial  
8 growth factor D (VEGF-D), vascular endothelial growth factor E (VEGF-E), placental  
9 growth factor (PlGF), acidic fibroblast growth factor (aFGF), basic fibroblast growth  
10 factor (bFGF), or angiopoietin-1 (Ang1).

1 19. The method of claim 15, wherein the chimeric molecule is a fusion  
2 protein wherein the fusion protein comprises an angiogenic factor linked to a targeting  
3 molecule that specifically binds to a vascular endothelium.

1 20. The method of claim 19, wherein the angiogenic factor is vascular  
2 endothelial growth factor B, vascular endothelial growth factor B<sub>167</sub> (VEGF- B<sub>167</sub>),  
3 vascular endothelial growth factor B<sub>186</sub> (VEGF-B<sub>186</sub>), or vascular endothelial growth  
4 factor C (VEGF-C).

1 21. The method of claim 15, wherein the chimeric molecule is  
2 suspended or dissolved in a pharmaceutically acceptable carrier.

1 22. The method of claim 15, wherein the chimeric molecule is  
2 suspended or dissolved in a cell culture medium.

1 23. The method of claim 15, wherein the pharmaceutical composition  
2 is in the form of an injectable solution.

1                    24.     A polynucleotide comprising a nucleic acid sequence encoding a  
2     fusion protein comprising an angiogenic factor and a targeting molecule, wherein the  
3     targeting molecule specifically binds to a vascular endothelium.

1                    25.     The polynucleotide of claim 24, wherein the nucleic acid sequence  
2     is in an expression cassette.

1                    26.     The polynucleotide of claim 25, wherein the expression cassette is  
2     in a retroviral vector or an adenovirus-associated vector.

1                    27.     A method of inducing angiogenesis in a tissue comprising  
2     transfecting an endothelial cell with the nucleic acid of claim 24, whereby the cell  
3     expresses a fusion protein encoded by the nucleic acid.

1                    28.     A pharmaceutical composition comprising the chimeric molecule  
2     of claim 1 and a pharmaceutically acceptable carrier.

1                    29.     A pharmaceutical composition comprising the fusion protein of  
2     claim 6.